

ELMIDAE OF TAIWAN PART II: REDESCRIPTION OF *LEPTELMIS FORMOSANA* (COLEOPTERA: DRYOPOIDEA)¹

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ABSTRACT: *Leptelmis formosana* is the only member of the genus known from Taiwan. It is redescribed and the male genitalia and other characters are illustrated. Because of similar male genitalia but somewhat different external morphology, we regard *Leptelmis vietnamensis* from Vietnam as a subspecies of *L. formosana*. A key is modified from Brown and Thobias (1984) to include all known *Leptelmis* species of Asia.

The genus *Leptelmis* Sharp was reviewed recently by Brown and Thobias (1984). More than twenty species are known from Asia and Africa. *Leptelmis formosana* Nomura is the only species known from Taiwan. Nomura described this species in 1962 based on two adults collected by Yano in 1938. The descriptions only pointed out the differences between *L. formosana* and *L. parallela* Nomura from Japan. Brown and Thobias omitted these two species in their key to Asian species of *Leptelmis* since the original diagnoses were too ambiguous to separate them from *L. gracilis* Sharp from Japan. Actually, *L. gracilis* is quite distinct in elytral shape. Because its humeri are not prominent and the elytra are very broad at their apical 1/3, the body looks expanded posteriorly. Both *L. formosana* and *L. parallela* have prominent humeri and their elytra are subparallel-sided (Fig. 1). However, it is necessary to note that the wing polymorphism may accompany morphological change of pronotum and elytra (Delève 1945; Brown, personal communication).

While examining the insect collections of Taiwan Agricultural Research Institute (TARI), three specimens of *Leptelmis formosana* were found. We redescribe and illustrate the species here. In addition, we regard *Leptelmis vietnamensis* Delève from Vietnam as a subspecies of *L. formosana* due to its similar male genitalia but somewhat different external morphology. A key to all known Asian species, modified from Brown and Thobias (1984), is provided to include *L. formosana* and *L. parallela*.

The following description of coloration is based on alcoholic specimens viewed under a white light source. Body length is measured from apex of pronotum to apex of elytra.

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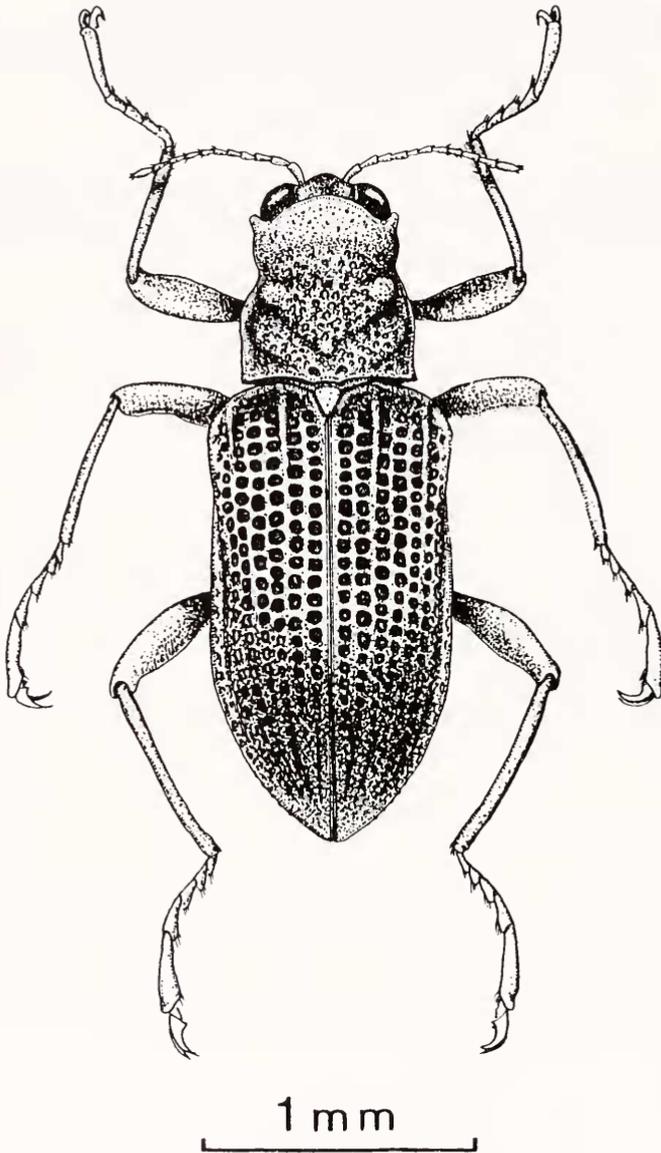


Fig. 1. *Leptelmis formosana formosana* Nomura, dorsal aspect.

Leptelmis formosana formosana Nomura

Leptelmis formosana Nomura, 1962, Tôhō Gakuhō 12:48.

: Brown and Thobias, 1984, Pan-Pacific Entomol. 60(1):28.

Length 2.3–2.4 mm, width 0.8–0.9 mm. Body elongate, subparallel-sided, convex dorsally. General coloration brown, with elytra feebly shining. Epicranium darker than other portions; venter lighter than dorsum; antennae, palpi, tarsi and genitalia translucently testaceous.

Head retractable within prothoracic collar; visible portion finely granulate and pubescent. Vertex concave at middle, impressed in a band on each side toward antennal base. Frons convex at middle, about 3/5 as broad as width across eyes. Eyes rather large. Frontoclypeal suture indistinct. Labrum transverse, anterior margin feebly truncate with frontal angle round. Antennae 11-segmented, barely reaching pronotal base; apex of distal segment acute.

Pronotum longer than broad by about 1.1 times; widest at basal 2/5, thence subparallel posteriorly to base; narrowest at middle transverse impression. Anterior pronotal margin arcuate and projecting over the vertex; anterior angles subacute, slightly protruding outwards; sides conspicuously bisinuate, not crenate; posterior margin feebly sinuate; basal angles subquadrate. Surface finely and sparsely granulate anteriorly, coarsely and deeply punctate at transverse impression and posterior portion. A subtriangular elevation located behind the transverse impression; two upper tubercles of the elevation very prominent; the lower tubercle smaller, with an indistinct ridge posteriorly; an indistinct impression composed of some punctures extending from transverse impression to near lower tubercle of the elevation. Two oblique, convergent grooves behind the subtriangular elevation deep, with two oblique elevations posteriorly. Base with two small, round feeble impressions.

Scutellum flat, very sparsely granulate.

Elytra 2.4 times as long as pronotum; humeri prominent; sides subparallel in anterior 2/3, thence tapering posteriorly to a rounded apex; feebly depressed at base, but convex at humeri. Each elytron bearing 9 punctate-striae; the 3rd and 4th striae merge on apical declivity. Strial punctures on disk rather large, subquadrate, separated from one another by less than half their diameters; punctures on apical declivity smaller and shallower. Strial intervals on disk narrower than half diameter of punctures; the third interval (between 2nd and 3rd striae) elevated at base. Lateral borders feebly margined and finely serrate. Epipleura narrowed gradually towards apex.

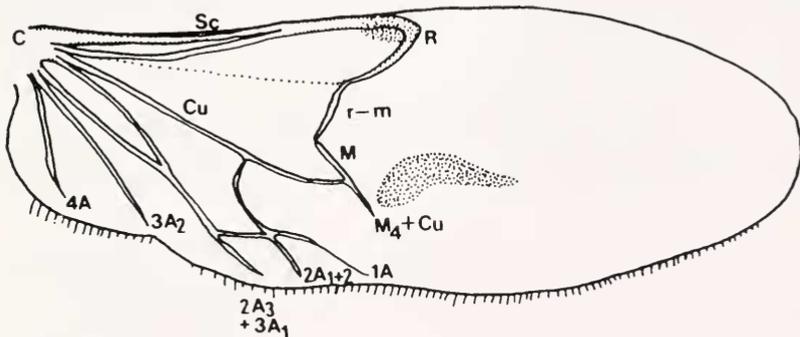


Fig. 2. Hind wing of *L. formosana formosana*.

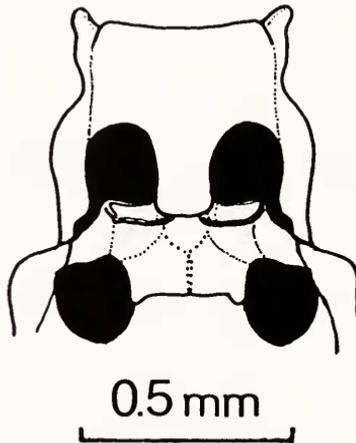


Fig. 3. Prosternum and mesosternum of *L. formosana formosana*.

Hind wing with venation as in Fig. 2. Venation essentially like that of the *Cyloepus* (Hinton 1940, Figs. 251, 252); Veins $3A_1$ and $3A_2$ separated near base.

Prosternum coarsely punctate posteriorly. Prosternal process with sides subparallel or slightly expanded posteriorly; apex truncate (Fig. 3).

Mesosternum with inconspicuous, blunt hind angles.

Metasternum with large, deep punctures; punctures separated at most by $1/2$ their diameters. Anterior position bare between mesosternum and longitudinal sulcus.

Abdomen with first two visible sterna with large, deep punctures similar to those on metasternum; punctures on the last three sterna finer and sparser. Apex of last sternum feebly truncate in males and round in females; males with two tufts of hairs and a semicircular depression at the apex of 5th sternum.

Legs long and slender, with fine pubescence and sparse granules. Tibiae with inconspicuous rows of small setae present along inner distal margins. Tarsi 5-segmented, that of foreleg shortest and hindleg longest; segments progressively longer from base to apex; apical segment as long as segments 1-4 combined, without ventroapical tuft of setae; claws large, each with a basal tooth.

Male genitalia as shown in Fig. 4. It is noteworthy that while the genitalia are connected ventrally with sternum IX, the parameres are parallel-sided, but when sternum IX is removed, the parameres expand outward as illustrated.

Variation: In one specimen the pronotum has its broadest width at base.

Specimens examined: 1♂, Tamsui, Taihoku (Taipei Hsien), 24-VIII-1941, S. Miyamoto leg.; 2♀♀, Heito (Pintong Hsien), V-1933, Y. Miwa leg. These specimens are deposited in Department of Applied Zoology, TARI.

Distribution: The type locality of this species is Takezaki (Chuchi, Chiayi Hsien). When more specimens become available we expect that this species may be distributed from northern to southern Taiwan. At present, the only known specimens are the two type specimens (in National Science Museum, Tokyo) and the three specimens reported here.

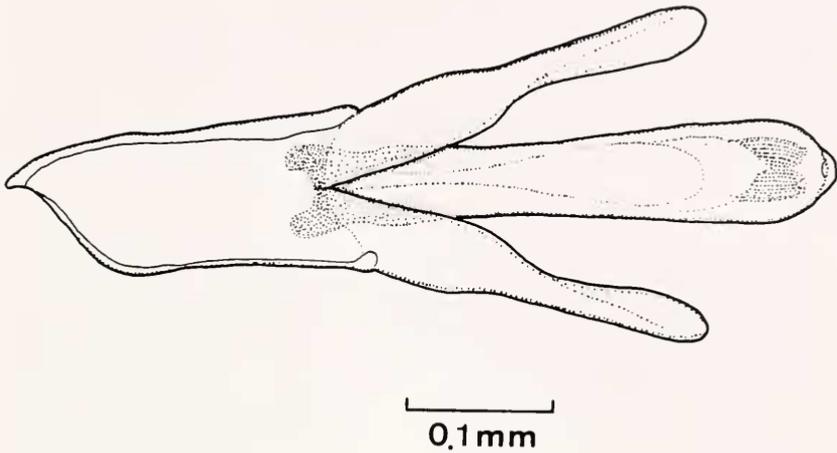


Fig. 4. male genitalia of *L. formosana formosana*.

Leptelmis formosana vietnamensis Delève

Leptelmis vietnamensis Delève, 1968, Ann. Hist.-Nat. Mus. Nat. Hung., Pars Zool. 60:154.
 _____: Brown and Thobias, 1984, Pan-Pacific Entomol. 60(1):27.

Since the male genitalia of this taxon is so similar to that of *L. formosana*, we regard it as a subspecies of the later. Compared with the nominate subspecies, the pronotum of this subspecies has (1) a smaller elevation; (2) more indistinct upper tubercles; (3) a longer ridge behind the lower tubercle and (4) a conspicuous longitudinal impression at anteromiddle of the elevation. Its body size is a little smaller than the nominate subspecies. These differences are shown in Fig. 5a and b.

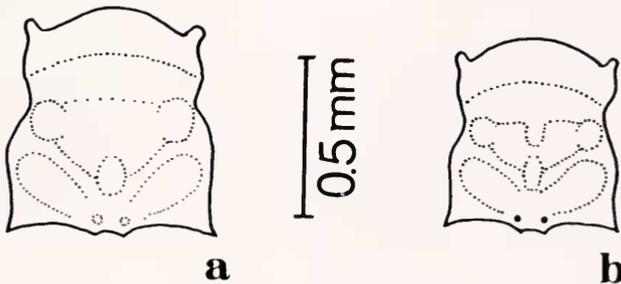


Fig. 5a. Pronotum of *L. formosana formosana*; b. of *L. formosana vietnamensis*.

Specimens examined: Holotype male, labelled "Vietnam, Prov. Ha-Tinh, forêtière Hùong-sôn, 150 m, forêt trop. pluv./à la lumière, 15. VIII, 1963, T. Pócs./Prépar. genit. No. 21266.2". Paratypes, 1♂, 1♀, with identical data; Prépar. genit. No. 21266.1 and 21266.3 respectively.

The following key is modified from Brown and Thobias, 1984, to include *L. formosana* and *L. parallela*.

Key to Asiatic Species and Subspecies of *Leptelmis**

1. Elytra maculate 2
Elytra essentially uniform in color or with the humeri lighter 5
2. Each elytron with 5 yellow spots (Vietnam) *L. signata*
Elytra with fewer than 5 spots or markings 3
3. Elytra without vitta in apical half on intervals, with only humeral and apical markings; larger (3.0 mm) (Sumatra) *L. stricticollis*
Elytra with both vitta, humeral and apical markings; smaller (less than 2.5 mm) 4
4. Elytra with strial interval 3 raised from base to apex; smaller (1.8 mm) (Philippines) *L. tawitawiensis*
Elytra with strial interval 3 raised only at base; larger (2.3 mm) (Vietnam) ... *L. basalis*
5. Elytra without prominent humeri 6
Elytra with prominent humeri 7
6. Elytra expanded posteriorly; venter punctate; larger (2.5-2.8 mm) (Japan) ... *L. gracilis*
Elytra not expanded posteriorly; venter granulate; smaller (2.15 mm) (South India) *L. philomina*
7. Tarsi 4-segmented (South China) *L. flavicollis*
Tarsi 5-segmented 8
8. Elytra with humeri paler 9
Elytra uniform in coloration; or if the elytra with humeral spot and /or paler 3rd strial interval, the body size less than 2.5 mm 10
9. Larger (2.5-2.6 mm) (Japan) *L. parallela*
Smaller (2.0 mm) (North India) *L. fracticollis*
10. Elytra with strial interval 3 raised from base to apex 11
Elytra with strial interval 3 raised at base only or extending to apical 1/3 13
11. Male genitalia with parameres subparallel in apical half (Sumatra, Java) ... *L. sulcata*
Male genitalia with parameres tapering from base to apex 12
12. Penis subparallel laterally, longer than basal piece by 1.7 times (Sri Lanka) *L. cederholmi*
Penis dilated at apical 1/4 and thence tapering basally, longer than basal piece by 1.5 times (Vietnam) *L. obscura*
13. Two upper tubercles of triangular elevation on pronotum very prominent; longitudinal impression at anteromiddle of the pronotal elevation inconspicuous (Taiwan) *L. formosana formosana*
Upper tubercles of triangular elevation on pronotum not very prominent; longitudinal impression at anteromiddle of the pronotal elevation distinct (Vietnam) *L. formosana vietnamensis*

* The species *L. nietneri* was transferred to the genus *Podelmis* by Jach (1984).

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